



DG/COAI/2021/253

August 20, 2021

Sh. Anshu Prakash, IAS
Secretary,
Department of Telecommunications,
Sanchar Bhawan, 20, Ashoka Road,
New Delhi – 110001.

Subject: Submission of note on “Enabling Licensing framework for network slicing in 5G”

Dear Sir,

1. This is in reference to the interactive session held in DoT with Industry and Academia on the **5G ecosystem** on 29th July 2021.
2. In this regard, please find enclosed the note on “Enabling Licensing framework for network slicing in 5G”.

We request for your kind consideration and support.

Thanking you,

Yours faithfully,

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Cc:

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Note on enabling Licensing framework for network slicing in 5G

1. 5G networks are envisaged to accommodate Applications and Services with different Latency, Reliability and Bandwidth. This would require effective sharing of network resources and network management techniques to achieve the requirements e.g. <1ms radio latency for critical machine type communication, up to 1Gbps speed for enhanced mobile broadband service etc.
2. The key technologies likely to be incorporated into 5G e.g., Multiple Input Multiple output (MIMO), Multi – Radio Access Technologies (Multi -RAT), Dynamic spectrum sharing (DSS), ultra- densification through small cells, Device to Device (D2D), Machine to Machine (M2M) along with other technological improvements will increase spectral efficiency. **However, these may also have more network management related challenges.**
3. **Network slicing is a distinctive feature of 5G** which enables division of a single network connection into many distinct virtual connections that use different amounts of resources to handle different types of traffic. Network slicing, which is fundamental to the 5G architecture, will enable the TSPs to build a single agile and flexible network that can cater to multiple use cases across different industries and different sets of customers. Network slicing, implemented through virtualization, will allow operator to provide different services with different performance characteristics to address specific use cases.
4. Each network slice operates as independent, virtualized version of the network. For an application, the network slice is the only network it sees. Advantage of this architecture is that the operator can create slices that are fine-tuned for specific use cases. One slice could target autonomous vehicles, another enhanced mobile broadband, another low-throughput IoT sensors, and so on. Different slices will have different QoS requirements, inherently invoking traffic management within each slice.
5. As a result 5G will not only enrich customer experience on personal mobile devices, but also provide a framework for implementation of IoT and Machine-to-Machine (M2M) communications. As the harbinger of exponential changes, network slicing in 5G promises to be a fundamental enabler of the digital economy, including IoT, AI, analytics, AR/VR, robotics and Autonomous Vehicles (AVs).
6. In context of Net Neutrality, GSMA in its whitepaper on Network Slicing¹, has recognized that Mobile network operators face unique operational and technical challenges in providing fast, reliable internet access to their customers, due to the shared use of network resources and the limited availability of spectrum and has recognized Network Slicing as a potent tool, which will provide options of how mobile operator networks can better meet customer needs. GSMA has further advocated in this whitepaper that network management plays an

¹ <https://www.gsma.com/futurenetworks/wp-content/uploads/2018/07/Network-Slicing-Use-Case-Requirements-fixed.pdf>

important role in improving service quality.

7. Federal Communications Commission (FCC) of United States of America (US) in its Fact Sheet² on promoting the deployment of Open RAN, has recognized Network Slicing as one of the featured of Open RAN and has sought comments on how FCC can facilitate such benefits/features of Open RAN, thereby implicitly recognizing Network Slicing as a legitimate and beneficial technological feature:

“The network slicing and other features of an Open RAN architecture could better enable very different application suites to run on the same hardware stack. We seek comment on the benefits outlined above and what role the Commission should play in facilitating these benefits”

8. Infocomm Media Development Authority (IMDA), Singapore has also emphasized on deployment of 5G with full-fledged features including Network Slicing. Extract from IMDA’s media release³ is reproduced below:

“The proposed network architecture is expected to be able to support 5G use cases requiring enhanced mobile broadband (“eMBB”) experience, uRLLC and mMTC, as well as network slicing, amongst other full-fledged 5G capabilities.”

9. Thus, in order to support these various use cases, 5G deployments will require far more innovative forms of network management, like network slicing, on public mobile networks supported by an enabling Licensing framework.

10. **Current Net Neutrality Rules:**

- a. As per the current Net Neutrality rules vide Licence amendments dated 26th Sept. 2018:

“ i. A Licensee providing Internet Access Service shall not engage in any discriminatory treatment of content, including based on the sender or receiver, the protocols being used or the user equipment.

ii. The Licensee is prohibited from entering into any arrangement, agreement or contract, by whatever name called, with any person, natural or legal, that has the effect of discriminatory treatment of content.”

- b. **Exceptions:** the current rules recognize exceptions to the Net Neutrality rules for specialized services and reasonable traffic management and

i. Specialised service mean “services other than Internet Access Services that are optimised for specific content, protocols or user equipment, where the

² <https://docs.fcc.gov/public/attachments/DOC-370266A1.pdf>

³ <https://www.imda.gov.sg/-/media/Imda/Files/About/Media-Releases/2019/Annex-A---5G-Policy-and-Use-Cases.pdf>



optimisation is necessary in order to meet specific quality of service requirements.” Further, Specialised services “are not usable or offered as a replacement for Internet Access Service; and the provision of the Specialised Services is not detrimental to the availability and overall quality of Internet Access Service”.

ii. Reasonable Traffic Management as may be specified from time to time: Current net neutrality rules specifies that to be reasonable, “***measure adopted by the Licensee that are proportionate, transient and transparent in nature***”

11. Given that network slicing and other business practices are designed to support the particular applications and services needed by particular verticals, for example tele-medicine, connected vehicles etc., as per our understanding it gets covered within the ambit of **reasonable traffic management measures**, even though they are not primarily focused on the performance of the network as a whole. Otherwise, network slicing can be included as part of ‘reasonable traffic practices’, which DOT is expected to specify from time to time.
12. Further, charging for access to network slices may also construed as differential treatment based on commercial considerations rather than differential treatment based on objectively different QoS requirements. Therefore, taking into consideration 5G deployment and associated network management to meet specific needs across as well as within the particular vertical, **such pricing should be allowed** as long as there is no violation of any broad Regulatory principle namely: Non-Discriminatory, Transparency, Non-Predatory, Non-Ambiguous, Not Misleading in the tariff offerings.
13. Moreover, we are of the view that the current definition of the Specialized services, as per the net Neutrality rules is not broad enough to encompass the type of flexible building block architecture associated with 5G networks. **Thus, we believe that the definition of specialized services under the current Net Neutrality rules needs to be broadened to meet 5G demands.**
14. DoT, in consultation with **the industry should come out with a specific list of specialized services.** The list should be broad enough to ensure that the industry benefits from the network slicing feature of 5G.
